DOCUMENT RESUME

ED 143 567 SO 010 227

AUTHOR Mundy-Castle, A. C.
TITLE Psychology and the Search for Meaning. Inaugural Lecture.
INSTITUTION Lagos Univ. (Nigeria). Dept. of Psychology.
PUB DATE 10 Dec 76
NOTE 24p.; Not available in hard copy due to poor legibility of original document

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS Cross Cultural Studies; *Developing Nations; Developmental Psychology; *Evolution; *Human Development; *Psychological Characteristics; Social Attitudes; Social Change; *Social Development; Technology

ABSTRACT

The author reviews the evolution of man to stress the role of psychology in a nation's social and technological development. It is especially important for developing nations to realize that technology must be coordinated with human social and psychological needs. To clarify the type of being man is, the author provides an account of human evolution. Characteristics which initially separated man from apes included bipedalism, dextrous hands and opposable thumb, use of tools, increased size and complexity of the brain, sexual division of labor, and acquisition of language and culture. Simultaneous evolution of tools and language probably provided a basis for the emergence of conceptual thought. Language was especially significant in allowing man to transcend the physical world and to formulate his own history and future plans. A cross-cultural study of psychological development in infants is described in terms of its implications that humans innately search for meaning in life. The author concludes with a comparative analysis of the effects of parental stimulation on cognitive development in western and nonwestern infants. The intellectual development of nonwestern infants may be more socially oriented than technologically oriented. (Author/AV)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED143567

AUG 16 1977

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL BY MICROFICHE ONLY HAS BEEN GRANTED BY
A. C. Mundy-Castle

TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE NATIONAL INSTITUTE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER."

INAUGURAL LECTURE

A. C. MUNDY-CASTLE, M.A., Ph.D., F.B.Ps.S.
Professor and Head of the Department of Psychology
University of Lagos
Nigeria

PSYCHOLOGY AND THE SEARCH FOR MEANING

December 10th, 1976.

SP 010227

ED143567

Life in the modern era demands a careful balance between science and technology on the one hand, and culture and art on the other. This balance serves to maintain a sense of meaning in life. In the world at the moment, there is a fear among some that the scales have gone too far over on to the technological side, with a resultant deterioration in social values and an associated loss of meaning. This is of concern to western and non-western nations alike: the former because of the erosion of spirit that has accompanied the rise of modern technology, the latter because, while they have an urgent need for technology, they would prefer not to lose their souls in the process.

A solution to the dilemma would seem to lie in a fusion of science, technology, culture and art. Developing countries should take this into account in the planning of their future. They must avoid an overdomination of life by soulless technology, for such a life can quickly become meaningless.

Nature is the context out of which man arose. It is important to realise that there is meaning everywhere in nature which may be compared to a gigantic communication system. Survival in nature depends on responding appropriately to critical signs - in other words, on accurately deciphering their meaning. As the famous biologists, Darwin and Wallace (1858) were the first to note, one reason why flowers look beautiful as to attract the insects that will spread their pollen and ensure the continuance of the flowers' species. The less attractive the flower, the less is the likelihood that its pollen will be distributed. Similarly the wings of some moths and butterflies bear striking resemblances to a menacing face - which serves to frighten birds and other predators away. The more frightening the face on the butterfly's wing, the greater are its chances of survival and reproduction.

../2.

SP010227

These are but two examples of an infinite variety of meaningful signs that occur in nature. Another is shown in the instinctive sucking reaction of a newly-born infant to the intrusion of a nipple into its mouth. If the baby did not react in this way he would be unlikely to survive. His sucking is therefore meaningful. Similar signs of meaning are everywhere in nature, but may be difficult to observe. Thus it took the zoologist, Karl von Frisch, twenty years to interpret the meaning of the dancing habits of honey bees (Krogh, 1948). It is now known that the bees inform their colleagues where to go for honey through a special kind of dance, the pattern of which contains information regarding which way and how far to go.

Before the evolution of man, meaning was locked within nature. The struggle for survival among living organisms was, as it still is, strictly according to nature's rules. There is no planning in the reactions of non-human organisms to problems of survival. Their modes of solution are in terms of the blind forces of nature.

Man's method of survival is quite different. He uses symbols, especially language, to dissect and resynthesise nature, to extract the meaning that is locked within it. Man uses words and symbols to categorise the various aspects and dimensions of nature, so that he may refer to them and manipulate them in their absence. With symbols, he is able to observe, analyse and reconstruct reality according to special rules, such as those of art, language, science and mathematics. In this manner he is able to transform natural and soical reality according to orderly principles - for example, by making steel out of iron ore, heating water by solar energy, sacrificing a goat, landing and communicating with a robot on Venus, dispatching emergency supplies to a

../3.

disaster area, carving an image, painting a picture, performing an initiation rite, or giving an inaugural lecture.

The transformation of nature by man is archaeologically very recent, starting perhaps some 3 million years or so ago, with most of the change occurring in the past 500 years, with quickening tempo. Just when language emerged is difficult to state with any precision. We can say, however, that our ancestors of between 250,000 and 100,000 years ago were developing a rich and complex cultural life, which must surely have incorporated language. Thereafter there occurred an escalating series of technological innovations with dramatic social and ecological consequences. The agricultural revolution which took place in the Middle East some 10,000 years ago produced lasting changes in social and economic living patterns, and led to the world's first cities, built in Mesopotamia around 4,000 B.C. (Jorgensen, 1972). It was here that the art of writing was discovered, this being a crucial component in the emergence of modern science and technology. These have their roots in the ancient Greek and Roman cultures of 600 B.C. to 300 A.D. After a long period of obscurity during the so-called dark ages, science and technology then showed a rapid spurt, triggered by the Italian Renaissance some 500 years ago. With the invention of the printing press and the prevailing philosophy of British empiricism, they led quickly to the modern era of atomic energy, solid state computers, space travel, genetic engineering cybernetics and so on. They also produced adverse effects with increasing frequency. The ill-considered and anti-social application of modern technology during the past 150 years has resulted in a variety of ecological disturbances which seriously threaten our future. More and more animal species are becoming extinct, there is alarm about the rate of growth of the world population, vital natural resources seem to be running short, millions are

../4.

crowded into cities in hunger and squalor, the earth, sea and air are polluted, war and violence continue unabated, and more and more people seiously wonder about the meaning of modern existence. Who among us has not had this kind of experience when jammed for hours in Lagos traffic?

Contemporary nationhood demands scientific and technological intelligence for economic reasons if no other. There is no way out of modernisation, whether we like it or not. We may however learn from the western experience of technological growth, which has been one of greater environmental control at the cost of dehumanisation and alienation. It seems the kind of cultural pattern required for preventing such socials ills is more like that of traditional African societies than those of modern Europe or America. African cultures are socially-oriented with powerful group-ties. Compared with western culture they emphasise a more ecologically-sensitive approach to the solution of problems. That is, they give consideration to all rather than a selected few of the aspects of a problem. In contrast, western culture thrived on individualism, fragmentation and abstractionism. Its approach to technology was unidirectional and single-minded, aiming to get what was wanted out of the environment as quickly and cheaply as possible for a while this approach seemed to work, that is, until the side effects began to show themselves with ominous frequency. Also it depended on cut-throat capitalism, which necessarily carried with it human injustice and degradation. It is now recognised that technology must be co-ordinated with human social and psychological needs in order for it to properly to serve man. The approach has to be total, not partial, or fragmented. Everything has to be accounted for. Only in this way can meaning in life be preserved. It is essential that developing nations be aware of this in their planning, to guard against

../5.

dehumanisation and to adapt their traditional cultural values accordingly. The object of the present paper is to examine the role of psychology in this process, with a view to directing society and technology so as to provide a meaningful existence.

A first requisite is to understand how man came about and what sort of a being he is. To this we shall now turn

HUMAN EVOLUTION

It is about 5 billion years since the Earth was formed, and 3 billion since its first single celled life forms appeared. There followed a succession of evolutionary developments which led, much later to the appearance of plants and animals in the sea, and plants, insects, reptiles (including the dinosaurs), birds and mammals on the land. Some 20 to 30 million years ago there emerged from the mammalian stock a species of ape called Dryopithecus, or Proconsul africanus. These were chimpanzee-like creatures who inhabited the first warm sub-tropical forests of Africa. They are supposed to be the ancestors of both ourselves and the modern apes (Breger, 1974; Buettner-Janusch, 1973; Reynold, 1976).

The evolutionary development of the hominid line started as a reaction of a group or groups of these apes to some profound ecological change. This seems to have occured in East Africa, forcing our Dryopithecine forebears to move from the trees to the open plains. The living and child-rearing requirements of this new enviroment were very different from those of the forest. Survival now depended on hunting in the open, and on a life-style adapted to the savannah ecology of the East African plains.

The demands of this life-style created evolutionary selection pressures that encouraged the emergence of increasingly human-like forms. The long-term result, some 3 to 4 million years ago, was the appearance in East and South Africa of the man-ape, Australopithecus africanus. There were at least two versions of

this creature. One was vegatarian and died out. The other turned to meat eating and became our forebear. These Australopithecine ancestors of man could walk erect on two feet (known as bipedalism), had teeth that were more human than apelike, and could use their hands for manipulating tools. These features are all interrelated. It is also important to emphasise the high degree of social organisation of Australopithecus and his more ape-like predecessors. The social aspects of human life have their origins in man's distant evolutionary past. Although Australopithecus could communicate socially by non-verbal signs, vocalisations and gestures, it seems unlikely that he could use language as we know it, since his brain-size was still in the ape-range and was poorly developed over the parietal and temporal areas, which are the ones involved for symbolic processing. Similarly his frontal lobes were small, suggesting a lack of ability for conceptual thought and future planning.

Between the appearance of Australopithecus 3-4 million years ago and modern man some 50,000 years ago, several races of Homo erectus (the man who stood erect) appeared, not only in Africa, but in Europe and Asia as well. These early men showed progressively larger brains and smaller teeth than Australopithecus, and were clearly skilled in using and making tools. Thus in one archaeological site, a three stone bola was found, estimated as about 500,000 years old. The bola is an ingenious instrument incorporating cords with stones on the end. When thrown at fleeing animals or birds it can bring them to the ground. A similar instrument is still used in Argentina today. Ancient evidence has also been found of one of man's first spectacular technological achievements - the control and use of fire - found with the remains of Peking man in China, dating back some half a million years (Lazarus, 1974).

When man first used language it is impossible to say. Very probably it emerged in association with the rapid increase in brain size that occurred between the appearance of Homo erectus and

our own species, Homo sapiens (Hockett and Ascher, in Shepard and McKinley, 1969). The first version of Homo sapiens was the Neanderthal man, who occupied much of western Europe some 100,000 years ago. Not much is known about Neanderthal life, apart from their use of burial rituals for their dead. This suggests they had a concern for life after death, which is an essentially human characteristic.

During the Neanderthal period, a new form of Homo sapiens appeared, one that was biologically very similar to our own, known as Cro-Magnon man. Neanderthal man then disappeared, for reasons that are obscure. It has been suggested that he dispped out of the contest with Homo sapiens No. 2 because of the latter's invention of projectile weapons (spears), which were much more effective than the clubs and bludgeons favoured by Neanderthal man (Brues, in Montagu, 1962, pp. 213-4). An interesting book on the eclipse of Neanderthal man has been written by William Golding, called 'The Inheritors'.

Our evidence suggests that the basis for human culture was well-established some 100,000 years ago. Tools of various kinds, burial sites, sculptures and other actifacts have been found associated with the fossils of early Homo sapiens, suggesting the emergence of a rich and complex cultural life. The 35,000 year old burial sites of Cro-Magnon man contain objects imported from long distances, indicating well-established trade and commerce even at that early period in modern man's past. There is also a report from Russia of a 35,000 year old skeleton dressed in trousers and pullover shirt made of fur and adorned with beads and a bracelet of mammoth ivory, in a grave stocked with tools of various kinds (Dubos, 1968, p. 42).

During the most recent period of man's evolution, very rapid changes occurred in the size of the frontal and parieto-temporal regions of the cerebral cortex, the areas responsible for planning symbolism, and language. It is highly possible that these cerebral

changes were associated with the increased complexity of social life and the development of more powerful forms of communication, especially language.

Let us now evaluate the evolutionary development of man in order to identify the key variables involved. Central in the process is the remarkable growth of the brain, which has increased in size 2½ times during the last 3 million years. The earliest of the ape-men had brains occupying 600 c.c., which is similar to the chimpanzee. The fire and tool-using men of 600,000 years ago had brains averaging 1200 c.c., while the Neanderthal brain of 100,000 years ago was 1500 c.c., which is much the same size as the brain of modern man, although it probably had a different order of complexity.

Another important factor is the difference in female sexual receptivity of humans, contrasted with that of female monkeys and apes. Whereas the latter have brief periods of oestrus, or sex receptivity, human females are more or less continuously receptive. This difference in sexual physiology of the human female initiated a new form of social organisation - the human family. Human societies are organised round husband-wife relationships, with labour divided so that the wife is the mother and caretaker of children, the father the hunter and protector (Breger,1974). This patterning of work according to sex is linked with another, key factor in the evolution of man, known as noeteny, or the birth of immature forms. The human infant is immature at birth, undergoing a prolonged period of helplessness, during which it has to be looked after continuously, and initiated in the art of living.

It may be perceived that many interrelated influences combined to produce man. The more important of these were bipedalism, dexterous hands and opposable thumb use of tools, increased size

and complexity of the brain, immature birth and helpless infancy, sexual division of labour, acquisition of language and culture. The way these various processess interacted to produce man is complex and thought provoking, as we shall now discuss.

Firstly, we should recall the activities of our forebears when they were still living in the forests. They were well adapted to a life in three dimensions, afforded by the trunks and branches of trees. Their vision could easily handle near and far, and their hands were skilled in grasping and manipulating. They operated in loosely knit groups with a complex social organisation and could communicate with their fellows by facial expressions, gestures, bodily movements, vocal utterances, such as grunts, and specialised call-signs. Babies were suckled and maintained close contact with their mother in early life, learning how to survive as they grew from infancy to maturity.

This was the behavioural repertoire of our ape ancestors when the ecological change occurred which forced them from the trees to the plains. Much of this behaviour still exists in man, and the keen vision and skilled hands of the apes were a prerequisite for the invention of tools, which in a sense, made man.

The discovery of tools, like the discovery of language, was not a sudden event. Both occurred as process-components in the evolution of man. Tools probably came about in the first instance when some of our ancestral apes, in the struggle for survival in the plains, started picking up bones, sticks or stones to use for some purpose, like in defence or attack, or in order to get food. Such occasional tool-use probably continued for millions of years. Those individuals who were best able to learn how to use tools for survival were the ones most likely to bear children, while those who were

../10

inept were likely to die early without any offspring. An evolutionary trend was thus started, with surviving generations becoming increasingly skilled at tool-use, and, as time went on, at making tools (Montagus, 1962)

Development of skill with tools must have been partly dependent on a facility for absorbing, generating and communicating information pertaining to the new tool-using way of life. It is thus likely that the evolution of language went hand-in-hand with the evolution of tools, and that the two together provided a basis for the emergence of conceptual thought. As already indicated it must have been a very slow process, especially in the beginning. When apes were first forced by ecological changes to move to the plains they already had hands skilled for grasping, together with efficient stereoscopic vision and hearing. Adaptation to the savannah ecology of the plains encouraged bipedalism, thereby freeing the hands for carrying and other purposes. The upright gait assumed by these early hominid forms put pressure on the hips and pelvic girdle and constricted the birth canal. This increased the likelihood of brain damage during birth, particularly since the new tool-using way of life favoured survival of individuals with bigger brains. Nature's solution to this dilemma was to encourage neoteny - the birth of immature offspring, which in turn resulted in progressively longer periods of helpless infancy and dependent childhood.

At this point we should introduce the psychological concept known as socialisation. This is the process by which an individual becomes adapted to his social enviroment, enabling him to be recognised as a member of his society. The long periods of dependency of a child on caretaker created by neoteny enabled socialisation to proceed while the brain was still maturing and in a state

../11.

of maximal plasticity. This facilitated the acquisition of tool-using skills as well as the acquisition of language. The net result was the emergence of a new and distinctly human form of adaptation, known as cultural adaptation. This differs radically from evolution by natural selection, which operates genetically through heredity, and is very slow to produce change. In comparison, cultural adaptation is extremely rapid, involving the symbolic dissemination through society of the experience and ideas of its members and the transmission of this information from generation to generation by socialisation. Whereas natural selection is genetic and Darwinian, cultural adaptation is Lamarckian, since it involves the transmission of acquired experience (Medawar, 1963).

Only man possess culture, which comprises his tools, implements, clothing, ornaments, customs, institutions, beliefs, rituals games, works of art, language, and so on (Buettner-Janusch, 1973,p.312) Culture depends on man's capacity for using symbols and has been described as superorganic, to distinguish it from the organic mode of natural selection (cf. Dobzhansky, 1962). The emergence of culture in human evolution marks the crucial step that occurred between animal and man.

With reference to the socialisation process, we should note that it is not simply a matter of passing over the cultural system from one generation to the next. Children seem somehow to extract the rules of life from their experiences. Each one of us constructs his own version of culturally-inspired reality and brings this to bear on the people, objects and situations we encounter. Culture and human knowledge is thus transmitted by a process of continuous reconstruction, and inevitably undergoes change (Brown, 1970).

../12.

Looking over the evolutionary history of man, two key innovations stand out, namely tools and symbols, especially language. Language is itself a kind of tool, in the sense that words and sentences may be put to use to produce some desired effect. But language is a very special tool, since it frees man from the undivided totality experienced by other animals, who seem to be "at one" with the natural world. Man's attainment of language enables him to differentiate the objects of his senses, to categorise significant features of reality, to refer to them in their absence, and to reassemble them in novel ways. In this manner he is able to reorganise the natural world to suit his own ends, to formulate his history, and to plan his future.

Language is made from symbols. A symbol is something physical, like a certain sound, a movement of the body, a mark on a surface, and so on. These physical events are given meaning by those who use them as symbols. The meanings are quite arbitrary, bearing no inherent relation to the physical event. Thus there is nothing in the physical sounds which make up the word "Deputy Vice Chancellor" that relates to the meaning of the word. Its meaning has been established through cultural tradition, and we have to learn what convention dictates, namely that the DVC is an important university official, whose name, in the present case, is Professor Adesola. The process whereby language is learned occupies the first few years of life, when the brain is still maturing and the child is dependent on its family. At about one year, infants may start using a world or two, and by 18 months they may have 20 or more words. After this there is a rapid increase in vocabulary, so that by 2 years the child may know as many as 300 words and well over a thousand words by 3½ years. In the same period, at about 2 years,

../13

the child starts combining words into simple sentences with subject and predicate. Very quickly after this the child discovers the rules of grammar, showing such knowledge in his speech. Thus, the 3 - 4 year old can use past and future tense, ask questions, use the negative and can generally put sentences into appropriate syntactical order. His knowledge of grammar can be shown by his mistakes with irregular verbs, e.g. he comed yesterday, I falled, it breaked, two mans, my foots, many sheeps. The child has not heard any of these phrases. He is generalising grammatical rules from other instances, thereby demonstrating that he has internalised the rules (Brown, 1970). Studies by Anni (1972), Laseinde (1975) and Akowonjo (1976), third year students in the Department of Psychology, have confirmed these developments in Yoruba and Edo speaking children, and it is probable that this is how children everywhere learn to use language. The discovery and internalisation of grammatical rules is evidence of the construction by the child of an internal model of external reality and is the work of a distinctively human intelligence. Thus only man uses language. True, some chimpanzees have recently been laboriously taught over a long period of time how to use the rudiments of the sign language of the deaf, but they seem unable to go beyond the naming of objects, and cannot master the rules of grammar or the asking of questions. Apes and monkeys in their natural setting do indeed have a communication system, one which we also possess to some extent. This refers to the communication of emotional states, such as aggression, submission, fear or pleasure, expressed by grunts, grimaces and gesticulation. However, while apes and monkeys communicate a lot about their feelings, they communicate very little about the external world, which is a major concern of language, and which makes possible many of the

../14.

most significant accomplishments of human culture. Language enables a detachment from reality into the intellectual world of abstract symbols. It is through this detachment that man has made his enormous scientific achievements (Breger, 1974). But, by the same token, it opens up for man the possibility of rendering himself extinct. Written language in particular has encouraged an excessive detachment from reality, reminiscent in some ways of the mental disease known as schizophrenia. This detachment shows itself in the determination of actions by what is printed on pieces of paper, rather than in real life actuality. The schizophrenic lives too much in a reality of his own making and fails to notice when it no longer matches the real world. Likewise the bureaucrat comes to have so much faith in the world of his papers that when he signs one and passes it on, he thinks he has accomplished something real, when this may well not be the case. For while plans and programmes may seem perfectly meaningful on paper, they are often meaningless in reality. This is well-illustrated in the following example of an attempt at cross-cultural communication which failed. It occurred in Lesotho when that country was still the British dependency of Basutoland, and was part of an unsuccessful rural development programme (Wallman, 1965).

A poster was drawn up in order to help teach people correct cooking and feeding habits. On the poster were two clock faces. There were no numbers, but identification by the initiated was possible by pairs of clock-hands. One clock read 1250 and had "30 minutes" written under it, the other read 1215 with "15 minutes" beneath it. Both clocks were circled by a series of vegetables, each with a Sesotho name underneath. The caption in Sesotho, read, "Cook them as long as this because vitamins are killed by heat."

../15.

"As long as what?"

The clock faces were drawn in red, as were the carrot and the beetroot. No one had any idea they were clocks. The most general interpretation was tomatoes, but some suggested slices of melon.

We are, I am sure, all aware of similar examples. The important lesson is that if one is trying to communicate information one should ensure that the conditions of meaning are clearly established. This necessitates the use of culturally familiar objects and concepts as vehicles for communicating new ideas.

It also requires an understanding of the psychology of the people concerned, whether they be from another culture altogether, or from within one's own culture. Either way, communication will not occur unless the conditions of meaning are established, this being particularly important in education. Here I will quote the amusing case of the Kpelle child in Liberia who was asked by his teacher to recite the multiplication tables. He began: "La-de-dah-de-dah-de-dah, lah-de-dah-de-dah," at which point the teacher interrupted, asking him what he was saying. The child said he knew the song but not the words (Gay and Cole, 1967). Last night while talking with my artist friend, Babarinsa, he stated: "You can only communicate with people who understand you."

Meaning in Infancy Let us now examine the nature of meaning through its emergence in the earliest months of life. First, I will report on some experimental and observational studies currently being conducted by our Psychology Department in collaboration with the Institute of Child Development and the Department of Paediatrics, University of Lagos (thanks to Professor Ransome-Kuti and his colleagues, especially Dr. Odiakosa). The research is

../16.

concerned with psychological development in infancy, and its results suggest that man is innately disposed to search for meaning.

One of the aims of the study is to investigate the manner in which young babies use their eyes to explore their enviroment, with particular reference to visual attention and anticipation. The study is cross-cultural in the sense that it replicates one conducted by myself and Anglin (1974) in Cambridge, Massachussetts, U.S.A. A primary reason for this replication is to ascertain whether the cultural differences in early experience of the two sets of babies make any difference to their visual development, this being an important factor in the formation of technological skills. The Cambridge babies were all white upper middle-class and most of them were actively encouraged by their parents in visual attention and exploration. This was done by use of special toys and mobiles distributed over and around their cots, prams and chairs. In contrast, the Lagos babies are mostly from the working and lower middle classes. None of them are exposed to attention-eliciting toys and mobiles, nor do their parents have such an active interest as the Americans in encouraging visual development. There are of course many other important cultural differences, but for the moment these need not concern us.

The age-range studied is the first eight months of life. The Cambridge experiments suggested that development in use of the eyes proceeds according to an invariant sequence of three stages the last of which is well-established by about 4 - 5 months. We do the experiment by having our little subjects sit in front of a large box. In the front of this box are two windows. At the back of the box, two observers are standing, one for each window,

../17.

They look through one-way mirrors at the baby, watching his eyes. Each observer presses a signal button whenever the baby is looking into his particular window. These signals are registered on a polygraph recorder, together with recordings of the stimuli used to attract the baby's visual attention. The stimuli are a pair of gaily-coloured jewel-studded balls, one for each window. They are lowered alternately into the windows, one in the left, then the other in the right, and so on for 3 seconds at a time, with a 3½ seconds gap between each ball-presentation.

Our interest in this experiment is to establish the age at which a baby will anticipate the appearance of a ball in a window, and how such anticipation develops. What we have found is that babies exhibit three different patterns of looking, roughly correlated with age, showing considerable individual variation. The earliest of these patterns occurs between 10 and 40 or 50 days. It involves long looks at one window only with no attention to the other. The second pattern appears between 25 and 70 or so days, again with individual variation, and involves a matching of the baby's eye fixations to the presentations of balls, often incorporating anticipation as well. Thus when a ball disappears from one window, the baby may immediately look across to the other window and wait for the ball to appear.

The third pattern occurs between 50 and 100 or so days and involves two new components. Firstly there is the appearance and gradual elaboration of rapid side-to-side search movements, from one window to the other, especially in the intervals between ball presentations. Secondly, perhaps at a slightly older age, there appears what we call trajectory tracking", that is, the baby's eyes follow the path of the ball as it is withdrawn from the

window. They continue this trajectory even though the ball disappears behind the upper edge of the window. Their eyes may then move on up to the ceiling or across to the top of other window, in anticipation of the ball's impending descent. Babies using this third pattern of looking during our experiment may apply these search and scanning strategies to other objects or features in the room, e.g. by looking at a picture on the wall, or behind them at one of the nurses or their mother and so on.

We have now studied enough Lagos babies to be able to assert that they exhibit the emergence of the same three patterns of looking at much the same ages as the Cambridge babies. We are still studying older Lagos babies, that is, ones aged 5 - 8 months, and cannot yet give results about them. But we are in a position to propose that the unfolding of these three looking patterns is a cross-cultural universal, in other words, that it characterises human babies everywhere. We would like very much to establish this in yet a 3rd cultural setting.

AT THIS POINT, 5 MINUTES WERE DEVOTED TO THE SHOWING OF VIDEO-RECORDINGS OF THE BABY EXPERIMENT.

Points to note

a) 6 week baby being got ready for the experiment, with general view of laboratory
b) the baby starts the experiment
c) the balls are seen dropping into and out of the windows
d) baby watches the balls - note the incipient reaching of his right hand
e) a view from behind the window showing baby using the 3rd looking pattern

../19

receive more social stimulation and early emotional support than European babies (Mundy-Castle and Okonji, 1976) The issue here is whether in the long run this divergent stimulation brings about a differential patterning of cognitive development, with Africans acquiring an intelligence that is more socially oriented, Europeans one that is more technologically oriented (Murdy-Castle 1974).

Anticipation of the future suggests the need for a fusion of these two aspects of intelligence. Let me therefore end this lecture by urging the initiation of psychological research directed toward the cultivation of a more comprehensive, higher order global intelligence, one that includes both social and technological aspects, and which ensures the maintenance of meaning in Nigeria.

f) ~~end of experiment~~. Note baby's ~~different reaction~~ to social stimuli compared with purely physical stimulation.

I wish to argue that this cross-cultural study of the development of visual exploration and anticipation in infancy lends credence to the notion of man as a being who is disposed to search for meaning, or to "go beyond the information given" to use the phrase of the distinguished psychologist J.S. Bruner (e.g. see Anglin, 1973) The human infant in its earliest months acquires a great deal of practical knowledge about the world it lives in. By the time she acquires language towards the end of her second year, she is aware of the properties of reality and how to handle them. With the onset of language and symbolism, this practical knowledge is slowly transformed into the adult mind. A defining characteristic of this mind is its continuing search and need for meaning. If social conditions are such that meaning is not forthcoming, the result is likely to show itself in loss of identity and some form of mental disorder. Psychology, particularly applied psychology, has a considerable role to play in social affairs, to ensure that meaning is preserved.

An interesting question arises ~~from the differential~~ reaction of babies to social as opposed to physical stimuli, as shown at the end of the video display. The question concerns the extent to which their home enviroment emphasises one form of stimulation at the expense of the other. It is our belief that the American babies have greater experience of handling objects than the Nigerian babies. Similarly, the attention of the American babies was more often deliberately focussed on objective properties of reality through the use of toys mobiles and vocal guidance. On the other hand, we have evidence to suggest that African babies

../20.

REFERENCES

Akowonjo, D.O., Acquisition of Morphological Rules in Children Speaking Yoruba Language, B.Sc. Hons. Thesis, Dept. of Psychology, University of Lagos, 1976.

Anglin, J.M. (Ed.), J.S. Bruner, Beyond the Information Given: Studies in the Psychology of Knowing, Norton, New York, 1973.

Anni, S.N., A Study of the Acquisition of Morphological Rules In Children Speaking the Uzairue Language, B.Sc. Hons. Thesis, Dept. of Psychology, University of Lagos, 1972.

Breger, L., From Instinct to Identity the Development of Personality, Prentice- Hall, New Jersey, 1974.

Brown, R., Social Psychology, Macmillan, New York, 1970.

Buettner-Janusch, J., Physical Anthropology a Perspective, Wiley, New York, 1973.

Darwin, C. and Wallace, A.R., On the tendency of species to form varieties; and on the perpetuation of varieties and species by natural means of selection, J. Linn. Soc., 1859, iii, p.45.

Dobzhansky, T., Mankind Evolving the Evolution of the Human Species, Yale University Press, New Haven and London, 1962.

Dubos, R., Man, Medicine and Environment, New American Library, New York, 1968.

Gay, J. and Cole, M., The New Mathematics and an Old Culture a Study of Learning among the Kpelle of Liberia, Holt, Rinehart and Winston, New York, 1967.

Jorgensen, J.G. (Ed.), Biology and Culture in Modern Perspective, Freeman, San Francisco, 1972.

Krogh, A., The language of the bees, Sci. Amer., August, 1948.

Laseinde, C.L., The Acquisition and Development of Language in the Nigerian Child, B.Sc. Hons. Thesis, Dept. of Psychology, University of Lagos, 1975.

Lazarus, R.S., The Riddle of Man, an Introduction to Psychology, Prentice-Hall, New Jersey, 1974.

Medawar, P., Onwards from Spencer, evolution and evolutionism, Encounter, 1962, 21, 35-43.

Montagu, M.F.A. (Ed.), Culture and the Evolution of Man, University Press, Oxford, 1962.

Mundy-Castle, A.C., Social and technological intelligence in western and nonwestern cultures, in Cultures in Collision, Ed. Pilowsky, S., Australian Nat. Assn. for Mental Health, Adelaide, 1975.

Mundy-Castle, A.C. and Anglin, J., Looking strategies in infants, in The Competent Infant, ed. Stone, L.J., Smith, H.T. and Murphy, L.B., Tavistock, London, 1974.

Mundy-Castle, A.C. and Okonji, M.O., Mother-infant interaction in Nigeria, 3rd IACCP Congress, Tilburg, Holland, July, 1976.

Reynolds, V., The Biology of Human Action, Freeman, Reading and San Francisco, 1976.

Shephard, P. and McKinley, D., The Subversive Science, Essays Toward an Ecology of Man, Houghton: Mifflin, Boston, 1969.

Wallman, S., The communication of measurement in Basutoland, Human Org., 1965, 24, 236-243.